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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/029,210	12/28/2001	Takeshi Suzuki	111606	5383
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25944 7590 02/13/2003

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ALEXANDRIA, VA 22320

EXAMINER

NGUYEN, HUNG

ART UNIT	PAPER NUMBER
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2851

DATE MAILED: 02/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/029,210

Applicant(s)

SUZUKI, TAKESHI

Examiner

Hung Henry V Nguyen

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 9-12 and 14-20 is/are rejected.
- 7) ☒ Claim(s) 4-8 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 9-12, 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shafer et al (U.S.Pat. 6,496,306).

With respect to claims 1-3, 9, 11, 14-16, Shafer et al discloses an projection optical system which projects an predetermined pattern formed on a mask (3) onto a substrate (5), and which has a lens element formed of fluorite and a lens element formed of silica (see tables 1-8). The projection optical lens comprises a first lens group of positive power and including a lens element formed of a first material which is fluorite; a second group of negative power and arranged between the first lens group and the substrate; and a third lens group of positive power, which is arranged between the second group and the substrate (see fig.2, see claim 17).

As to claims 17-20, Shafer further teaches an exposure apparatus having a light source with a center wavelength of 200 nm or less (see col.3, lines 35-36); an illumination system for guiding the exposure light from the light source to the pattern on the mask (see fig.1) wherein the

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numerical aperture of the substrate side of the projection optical system is $NA > 0.75$ (see col.3, lines 39). Shafer, therefore, discloses substantially all of the limitations of the claimed invention. Shafer does not expressly disclose that the number of lens elements formed of silica is more than the number of lens elements formed of fluorite. However, Shafer suggests that no more than one lens of the projection optical system is made of fluorite (claim 1 and claim 17). This provides a clear suggestion that it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings Shafer to obtain the invention as specified in the above claims. It would have been obvious to a skilled artisan to employ more lens elements made of silica than lens elements made of fluorite in the projection optical system of Shafer for at least providing good achromatization and reducing fluorite degradation effect and improving the quality of the exposure device.

With respect to claims 10 and 15, although Shafer discloses projection optical system having five groups of lens. It is the Examiner's position that it would have been obvious to modify the teachings of Shafer to provide a projection optical system having first, second and third lens groups only since it would have been an obvious matter of design choice to reduce the number of working parts of a device (for example, see U.S. Patent 6,088,171 to Kudo) for at least the purpose of reducing the size and the cost of the exposure device.

Allowable Subject Matter

4. Claims 4-8, 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of

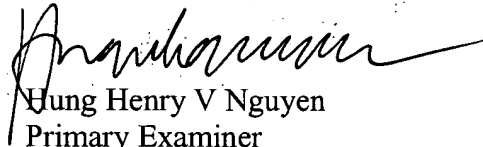
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allowable subject matter: the prior art of record either alone or in combination, neither disclose nor makes obvious a combination of a projection optical system having three lens groups satisfying specific conditions as recited in the instant claims.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V Nguyen whose telephone number is 703-305-6462. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 703-308-2847.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.


Hung Henry V Nguyen
Primary Examiner
Art Unit 2851

hvn
February 7, 2003